

Optimizing Noise Attenuation in Aircraft Exhaust Ducts Employing Passive and Active Absorbing Splitters and Struts, Phase I

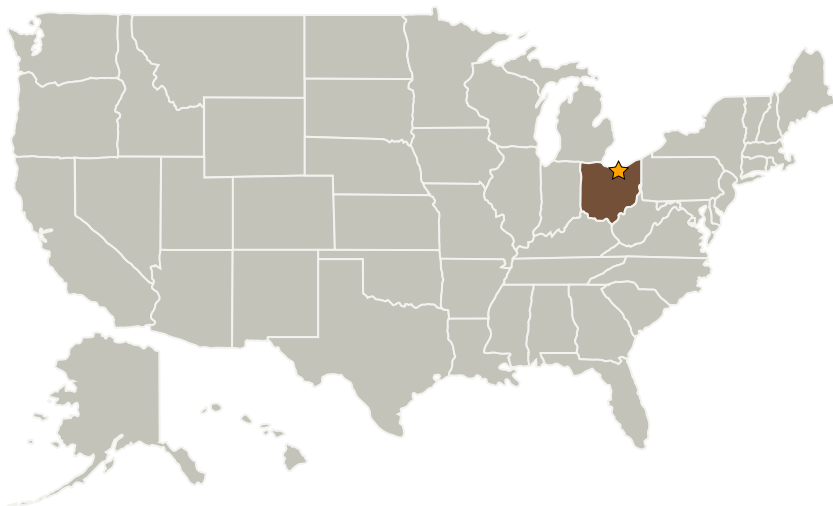
Completed Technology Project (2006 - 2006)



Project Introduction

NASA requires accurate numerical simulation of high bypass nacelle acoustics and the development of advanced nacelle absorption techniques to reduce engine noise levels. Thus, this Phase I effort will expand current Transient Finite Difference (TFD) nacelle algorithms to include ? Simulation of active and passive nacelle exhaust splitters, ? 3D simulation of passive and active absorbing radial struts, ? Optimization of multiple segment wall, splitter and strut absorbers for maximum noise reduction. The exceptional performance and accuracy of the TFD method has already been documented for passive and active noise reductions in 2D aircraft nacelles. Recent experimental data have show promise for significant noise reduction for active noise treated struts as well as classic exhaust splitters. Therefore, this Phase I study will extend the current TFD nacelle algorithms to optimize splitter rings usage in exit nacelle ducts and 3D active and passive treatment of exhaust duct struts. The Phase II effort will include the capability of analyzing more complex 3D ducts with circumferential-segmented absorbing liners as well as external cowling and airframe noise sources. The numerical algorithms of this TFD Phase I study will provide NASA Glen and industry an innovative tool for acoustic nacelle design.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
KJB Consultants	Supporting Organization	Industry	Strongsville, Ohio

Primary U.S. Work Locations

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.4 Aeroacoustics